Epstein-Barr Virus Infection as One of the Predisposition Factor for Colorectal Cancer

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There have been many studies reported that Epstein-Barr virus (EBV) infection is associated with nasopharyngeal cancer and Hodgkin's lymphoma.[1,2] Recently, many studies find that Epstein-Barr virus infection is also associated with the occurrence of other cancers such as colorectal cancer.[1,2] Song et al, reported that EBV LMP1 exon 3 and W fragments were detected in 27.7% and 32.2% of the colorectal carcinoma specimens, which were significantly higher than the positive rate of EBV gene in the adjacent non-cancerous tissues (4.0%, $p < 0.001$).[1]

Epstein-Barr virus (EBV) nuclear antigen (EBNA)-1 is the only viral protein expressed in all EBV-carrying malignancies. Gruhne et al, found that EBNA-1 induced chromosomal aberrations, DNA double-strand breaks, and engagement of the DNA damage response (DDR). EBNA-1 promotes genomic instability via induction of reactive oxygen species.[3]

In this new issue, Simatupang et al, found that EBV viral infection plays a role in the pathology of colon cancer. The findings of EBNA-1 expressions on lymphocytes B membranes proved that there was a chronic EBV infection in patients with colorectal carcinoma. This finding is inline with other studies which found the correlation between Epstein-Barr virus infection and colorectal cancer.

REFERENCES:

1. Song LB, Zhang X, Zhang CQ, Zhang Y, Pan ZZ, Liao WT, et al. Infection of Epstein-Barr virus in colorectal cancer in Chinese. Ai Zheng 2006;25:1356-60.
2. Besson C, Amiel C, Le-Pendeven C, Brice P, Ferme C, Carde P, et al. Positive correlation between Epstein-Barr virus viral load and anti-viral capsid immunoglobulin G titers determined for Hodgkin's lymphoma patients and their relatives. J Clin Microbiol 2006;44:47–50.
3. Gruhne B, Sompallae R, Marescotti D, Kamranvar SA, Gastaldello S, Masucci MG. The Epstein–Barr virus nuclear antigen-1 promotes genomic instability via induction of reactive oxygen species. PNAS 2009;106:2313-8.